

# **Quality Assurance Review Guide for Major Information Resources Projects**

**Version 1.0**

**Supersedes**

***Guidelines for Quality Assurance Review***

**February 1994, Version 2.9**



**Department of Information Resources  
Office of the State Auditor**

**November 1996  
Austin, Texas**

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# Preface

The *Guidelines for Quality Assurance Review* was first issued to state agencies and universities in February 1994 to support legislation enacted in the 73rd Legislative Session. This publication, entitled *Quality Assurance Review Guide for Major Information Resources Projects* (the Guide), replaces that document in its entirety. This Guide represents the extension of the legislation directing the statewide Quality Assurance Review of major information resources projects through fiscal year 1997.

The Quality Assurance Team, responsible for the implementation and oversight of Quality Assurance Review in Texas, continuously seeks to improve its processes to effectively support such a wide-encompassing program. To that end, and with first-hand experience conducting quality assurance reviews since 1994, the Team reviewed and modified the previous Guidelines document. Because the Guide represents the Team's "road map" to conducting a Quality Assurance Review and is the vehicle to communicate the Team's approach to state agencies and universities, the Quality Assurance Team revised and clarified the process steps to support practical application of the process. Overall, the processes associated with Quality Assurance Review have not been altered; however, this Guide incorporates additional detail or examples within a process to clarify the Team's intent.

Additionally, the Guide has been reorganized by section to provide easy access to a specific process or product. Section 1.0 provides an executive overview. Section 2.0 provides background information regarding the legislation, describes the objectives set forth by the Quality Assurance Team, and describes the agency appeal process that exists within each of the process steps.

Sections 3.0 through 8.0 are structured to correspond to each step of the Quality Assurance Review process in the order in which the step is encountered. A list of each step and its corresponding section is provided below.

Section	Step
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3.0	Initial Project Risk Analysis
4.0	Project Development Plan
5.0	Risk Analysis
6.0	Risk Management
7.0	Project Monitoring
8.0	Post-Implementation Evaluation Review

A glossary of terms used in this document is also provided.

Because the Quality Assurance Review process is continuously assessed by the Team, this document is subject to periodic revision based upon changes or

refinements made to the process. To the extent possible, subsequent revisions to this Guide, if needed, will be issued as Change Pages through fiscal year 1997. These pages will be numbered sequentially and will correspond to the version sequence within the current version of this document. For example, a Change 1 issuance will correspond with Version 1.1 of this Guide.

# Acknowledgments

This Guide was initially prepared in response to the legislation passed during the 73rd Session of the Legislature. The Quality Assurance Team would like to acknowledge the agency consultation committee, which provided direction and advice in the initial development of this Guide. The following agencies and universities were represented on the committee:

- Employees Retirement System of Texas
- Office of the Attorney General
- Office of the Comptroller of Public Accounts
- Texas Department of Insurance
- Texas Department of Human Services
- Texas Department of Mental Health and Mental Retardation
- Texas Department of Protective and Regulatory Services
- Texas Department of Public Safety
- Texas Department of Transportation
- Texas Health and Human Services Commission
- Texas Natural Resource Conservation Commission
- The University of Texas Health Science Center at San Antonio

The Quality Assurance Team appreciates the contributions of these agencies and their staff for their assistance in this process.





# Quality Assurance Review Guide

## 1.0 EXECUTIVE OVERVIEW

All agencies and universities are subject to the provisions of the General Appropriations Act, 74th Session, Article IX, Section 39. This section defines a Quality Assurance Review process that must be followed for all major information resources projects.

A major information resources project is defined as:

any information resources technology project identified in an agency operating plan whose development costs are over \$1,000,000 and includes one or more of the following:

- requires a year or more to reach operational status;
- involves more than one agency or government; or
- materially alters work methods of agency personnel and/or the delivery of services to agency clients.

In response to this section of the General Appropriation Act, Quality Assurance Team (QAT) members, comprising staff from the State Auditor's Office (SAO) and the Department of Information Resources (DIR) have developed and revised this Guide. This guidance document describes the processes that agencies and universities should follow in order to comply with Section 39. These processes represent a composite of standard requirements associated with systems development quality assurance. This Guide presents the scope of the entire process and represents the structure by which the QAT currently conducts a standard quality assurance review. It is not intended to serve as a planning or development methodology, nor does it endorse a specific methodology.

The primary purpose of this Guide is to explain and identify common procedures and practices that address quality assurance compliance within the scope of the legislation. Beyond that, because these processes represent a general approach by which to gauge project success, this Guide serves as a reference tool for an agency to effectively plan, manage, and evaluate an information resources systems development project, whether reviewed by the QAT or by an agency's internal oversight committee.

A brief description of the steps involved in the Quality Assurance Review process follows, in order of occurrence. Detailed descriptions of the processes are provided in Sections 3.0 through 8.0 of this Guide.

1. The agency prepares and submits its information resources (IR) project plans to DIR in the Biennial Operating Plan (BOP).
2. If the project meets the criteria of a major information resources project and is approved in the BOP, it is summarized by the DIR agency analyst and submitted to the Quality Assurance Team to determine if a quality assurance review is needed.
3. If the QAT determines the project meets the quality assurance review requirements, the agency may be requested to complete an initial project risk analysis questionnaire.
4. Based on a review of the completed risk analysis questionnaire, the QAT determines an initial risk level, assigns a corresponding monitoring level to the project, and may request the agency to submit a Project Development Plan to the QAT.
5. Based on a review of the information provided in the Project Development Plan, the QAT determines or revises the initial risk level and assigns the project a commensurate level of monitoring.
6. The QAT may also request the agency to conduct an independent risk analysis, prepare a risk management plan, and submit both to the QAT.
7. If needed, the QAT designates a monitor for the project. The monitor may attend project meetings, review agency documentation and reports, and generally work with the project team to evaluate the quality of the development effort.
8. Quality Assurance project reviews occur as designated by the QAT. These reviews provide an opportunity for the Team to review all pertinent information, i.e., results of the independent risk analysis, monitoring status, and any other available information, to evaluate whether the project is meeting its objectives.
9. If the QAT determines the project fails to meet its objectives, the QAT may initiate the process to rescind project funding. The agency may appeal that decision to the Quality Assurance Team.
10. At project completion, the QAT will decide if the project requires a post-implementation evaluation review. If required, the agency will conduct the review and submit the results in a report to the QAT.

**NOTE:** *The Quality Assurance Team has the authority to waive the review of a project at any time during the review process as it deems appropriate. Likewise, the QAT may review previously waived projects when circumstances dictate.*

**NOTE:** *While these processes are required for those projects identified as major information resources projects, the processes are recommended for all development projects.*



## **2.0 INTRODUCTION**

Quality assurance, project management, and risk management are mature concepts implemented in various technological sectors of industry and government. They are dynamic in definition, methodology, application, and outcome.

In general, quality assurance is a process by which an agency satisfies its technical and administrative performance requirements relatively free from discrepancies while meeting the user needs. Quality assurance must be a part of an organization's culture to ensure all of its products and services are of the highest quality. Project management is the process of planning, directing, and evaluating the development and implementation of a project. Risk management is an aspect of project management that entails identifying risks and developing ways to eliminate or mitigate those risks. Each of these functions must be present and actively supported in an organization to effectively direct a positive project outcome.

### **2.1 Background of the Legislation**

Historically, state agencies and universities have sought to leverage their investment in information technology to address the increasing demands for services and to remain effective and efficient in the delivery of those services. In recent years these agencies and universities have also experienced tighter budget controls and fewer available resources to support the timely delivery of quality information systems within budget. This trend has resulted in a statewide increase in expenditures for major information resources projects, prompting the State Auditor to consider the effect of the information resources oversight process on project management and development. The State Auditor concluded in an audit of DIR (June 1992) that the "missing link" in the information resources oversight process was the monitoring and performance evaluation of approved projects.

To address these concerns, the 73rd Legislature enacted legislation that directly affected the operations of DIR. Both Senate Bill 381 and Article V, Section 133 of the General Appropriations Act addressed the need to review major information resources projects while in the planning stage rather than reviewing the procurements after the planning has taken place. Additionally, the General Appropriations Act established a Quality Assurance Team comprising representatives from the Legislative Budget Office, the Office of the State Auditor, and the Department of Information Resources to review major information resources projects and approve project funding. The legislation also required the determination for project approval to be based on an independent risk analysis.

The 74th Legislature continued the quality assurance initiative by including Rider 39 in Article IX of the General Appropriations Act. This rider extends the Quality Assurance Review provision into the 1996–1997 biennium. The provisions are materially unaltered; however, the rider specifies that members of the Quality Assurance Team are representatives of the State Auditor’s Office and the Department of Information Resources. The Legislative Budget Office is available as required to participate in the QAT process, particularly in reference to project expenditure reporting and compliance with the General Appropriations Act.

## **2.2 Quality Assurance Team Objectives**

In response to the legislative direction, the Quality Assurance Team established objectives to support its primary goal to increase the probability that information resources projects will be successful. Through project oversight activities such as quality assurance review, risk analysis, and project monitoring, the QAT strives to ensure successful outcomes.

*A successful project is one that achieves the desired effect on the agency and project strategic outcome measures within the planned cost and schedule.*

The focus of statewide Quality Assurance Review is on major information resources projects in order to maximize successful outcomes. To achieve this, the following strategies are employed by the QAT in coordination with the agency:

1. Identify and analyze the risks to successful project outcome.
2. Develop the appropriate management and project controls to minimize those risks.
3. Monitor the project to:
  - a. ensure effective management and project controls are in place and utilized.
  - b. provide information to develop models to support future project planning.

The QAT intends to coordinate oversight and monitoring functions with state agencies and universities to ensure best practices are employed to guide the planning and administration of major information resources projects.

**NOTE:** *While these processes are required for those projects identified as major information resources projects, the processes are recommended for all development projects.*

## 2.3 Organization of the Guide

The Department of Information Resources and the Office of the State Auditor developed this Guide to communicate their role in the Quality Assurance Review process and to assist state agencies and universities to successfully implement quality information technology systems in a timely and cost-effective manner. The intent of this Guide is to explain and identify common procedures and practices that address quality assurance compliance within the scope of the legislation. These procedures and practices are not intended to represent an all-inclusive optimum methodology. The procedures and practices represent the integration of standard and accepted principles and practices associated with project management, risk management, and quality assurance. The result is a consolidated Quality Assurance Review process that responds to direction set by the Legislature of the State of Texas.

This document is intended to provide general guidance to those agencies with major information resources projects subject to the legislative requirement. Additionally, because these processes represent a general approach by which to gauge project success, this Guide serves as a reference tool for an agency to effectively plan, manage, and evaluate an information resources systems development project, whether reviewed by the QAT or by an agency's internal oversight function.

This Guide represents the Quality Assurance Team's approach to its review of major information resources projects and is organized by section to correspond with the progression of the review process throughout the life-cycle of a development project. Each section provides an overview of the QA process or product, the purpose of the process or product, a description of the steps involved in the process, key elements of the process or product, and other information that delineates and further supports the topic. The following list identifies the section number and the QA process or product that is described in that section.

<b>Section</b>	<b>Step</b>
3.0	Initial Project Risk Analysis
4.0	Project Development Plan
5.0	Risk Analysis
6.0	Risk Management
7.0	Project Monitoring
8.0	Post-Implementation Evaluation Review

## **2.4 Appeal Process**

An appeal process is available to agencies regarding all decisions of the QAT. An agency has ten (10) working days after notification of QAT action to request a hearing from the Quality Assurance Team members. Prior to the notification of the QAT action, the QAT may request a meeting with the project staff and the agency management to resolve issues that the QAT may have with the project progress, the project development process, the risk analysis, the risk management plan, or any other project management process.



### **3.0 INITIAL PROJECT RISK ANALYSIS**

The initial project risk analysis provides the Quality Assurance Team and the agency a baseline analysis of critical project attributes that can affect project outcome. The analysis is intended to determine if the agency's project planning, development, and management resources are sufficient to meet the requirements of the project. The QAT has developed a standard initial project risk analysis questionnaire to ensure a uniform approach to gathering the information necessary to assess key project factors.

#### **3.1 Purpose of an Initial Project Risk Analysis**

The initial project risk analysis questionnaire is intended to consolidate relevant project information that is generally beyond the scope of the data submitted in the Biennial Operating Plan (BOP). This information is reviewed by the QAT to establish an initial risk level and to determine any possible further actions that are needed. Additionally, this information is reviewed to determine if an independent risk analysis is required.

#### **3.2 Initial Project Risk Analysis Process Description**

A state agency or university communicates its information resources (IR) project initiatives to DIR through its Biennial Operating Plan or a BOP Amendment. The DIR planning analyst, in the course of his or her review of the BOP, determines if any of the IR projects identified meets the criteria of a major information resources project. If a project meets the criteria, the following steps support the initial project risk analysis.

1. After the BOP project receives DIR approval, the DIR planning analyst prepares a project summary based on the information available in the BOP. The analyst submits the summary to the Quality Assurance Team to determine if the Team requires further quality assurance review.
2. If the QAT determines the project requires further review, the agency may be requested to complete an initial project risk analysis questionnaire.

The questionnaire requests information from the agency regarding general areas of risk for the project. These questions concern the impact on statewide goals and objectives, the completeness of planning, and the management commitment to the project. A copy of the standard questionnaire is provided in Appendix A of this Guide.

3. The agency returns the completed questionnaire to the QAT. The

responses to the questionnaire and any other relevant project information will enable the QAT to determine whether the project is likely to meet its objectives and whether risks that could affect the success of the project have been identified.

4. Based on the information provided, the QAT assigns an initial risk level and a corresponding monitoring level to the project, and may request that the agency provide a Project Development Plan to the QAT.

***NOTE:** At any time throughout the project life-cycle, if the QAT determines that project objectives are not being met, the QAT may initiate the process to rescind project funding.*

### **3.3 Elements of an Initial Project Risk Analysis**

The initial project risk analysis questionnaire is designed to gather information about the agency and project environment and to identify and address the factors that relate directly or indirectly to the project's objectives. The agency should examine each of these factors, grouped below by major category, and provide relevant information that includes:

#### **1. Agency and project goals and objectives**

- a. Relationship of project to specific goal(s) in the agency strategic plan.
- b. Impact of project on the agency's service delivery, citing current baseline measures utilized and any additional measures that will be instituted to evaluate overall performance after project implementation (see Section 3.4).
- c. Impact of project on IR performance measures, such as cost, responsiveness, accuracy, reliability, timeliness, customer satisfaction, and maintainability, citing current baseline measures utilized and any additional measures that will be instituted to evaluate system performance after project implementation (see Section 3.4).

#### **2. Internal and external project dependency factors**

- a. Executive level support, identifying the executive sponsor(s) and the role the sponsor(s) will serve on the project.
- b. Major users and their participation and level of involvement in the project, including a description of the process and status of the system's business and functional requirements definition and

performance measures identification, and the users' role in system design, review, and testing.

- c. Functional analysis of current processes to eliminate non-value-added systems, products, or processes.
- d. Dependencies between the project and other projects, describing the impact if the project in question were not delivered.
- e. Interfaces and information exchange requirements identifying the level of complexity for each required interface.
- f. Partnerships with other organizations, providing full or partial support to the development, implementation, or ongoing maintenance of the system.

### **3. Project organization and resource management**

- a. Project management and/or systems development methodology, describing the project manager's, team's, and agency's experience with the methodology.
- b. Project manager profile, describing his or her past experience with similar projects, past training, primary project responsibilities, and project time allocation.
- c. Agency's internal review process for IR projects, providing samples of internal monitoring tools and reports, and specifying participants, frequency, and format of the review process.
- d. Configuration management, change control, and problem resolution processes.
- e. Resource cost estimating and scheduling approach, providing samples of each tracking system's output(s), specifying report frequency, review points and personnel involved, and variance management.
- f. Staffing (technical, support, user, etc.) requirements.
- g. Skills inventory and assessment: project requirements versus staff assigned, training requirements.
- h. Provision for contractor and/or consultant knowledge transfer, if applicable.

- i. Performance and product acceptance process.

#### **4. Project schedule, cost, or quality constraints**

- a. Optimum project schedule, based on project scope, available resources, cost considerations, and quality standards.
- b. Mandated project delivery date, citing source of requirement and consequences from failure to meet the requirement.

#### **5. Project risk analysis and management**

- a. Risk analysis methodology, describing rating factors, management plan, and interrelation to other project activities (see Sections 5.0 and 6.0).
- b. Project risk analysis results, identifying high areas of risk and areas potentially at risk.
- c. Risk management plan providing the actions that will be taken to mitigate the risks identified.

### **3.4 Project Outcome and Performance Measures**

Overall, the goals and objectives of a systems development project should correlate to the agency's strategies and outcomes that are identified in the agency's Strategic Plan. Additionally, the approach selected by the information resources project team should reflect the agency's IR Strategic Plan. A systems development project's performance measures are the basis for the quantitative and qualitative justification of the project. These relationships are initially identified in the agency's Biennial Operating Plan.

The performance measures of an information resources development project should reflect the purpose, objective, and goals of the system. The criteria by which a project is measured should address the business or service delivery requirements of the system to effectively assess its success. These business requirements, in turn, will influence the functional requirements of the system.

Performance measures should be defined as early as possible after project initiation by the primary benefactors of the system. The outcome or output measures should relate the functional requirements of the system to a definition of success. The system will demonstrate its success when it performs within the desired range of the pre-established measure.

Additionally, the business objectives and functional requirements of a system provide a basis to determine level of service objectives related to system support. The agency's measure of a project's success, that is, performance tied to its products or services, is inextricably linked to its measures of IR performance, such as cost, responsiveness, accuracy, reliability, timeliness, customer satisfaction, and maintainability. These measures are the basis by which IR services should be gauged. IR performance measures should be identified in conjunction with business outcome performance measures to reflect overall project goals and objectives.

Project performance measures should be approved by user management, agency IR management, and agency executive management prior to requesting DIR approval for the project as a part of the BOP. BOP documentation should provide both a definition and a quantified projection for each outcome measure identified.

After the measures are defined, the project team should establish the methodology to collect data that will report these measures throughout the project development and post-implementation phases. Measures should be taken from the operation of the system and collected regularly. A measure which cannot be obtained easily or cannot be quantified after implementation will hinder the comparison of the measures. It is the responsibility of the project manager to ensure the project's performance measures can be reliably obtained through a valid tracking and reporting system.

The project team should measure outcomes at least twice; once, after establishing a baseline outcome measure prior to implementing any project-related service, and again, after full services are made available. The difference in the two measurements will reflect the improvements realized from the IR investment. This information will be reported to the QAT if the project is requested to undergo a post-implementation evaluation review (see Section 8.0).

### **3.5 Managing Project Constraints**

A major information resources project plan will likely be modified throughout the project life-cycle. The project's schedule, cost, and quality are affected by requirements of the project. If requirements change, a corresponding change may be required in one or more of these project constraints. Initial project planning can minimize changes in later phases of a project.

To ensure that project planning is comprehensive and reflects the scope of the effort, a project work plan is developed to communicate

- the project requirements
- a summary of the work effort and resource requirements
- a work breakdown by phase that includes all tasks and resources necessary to support a given activity
- milestones by which to measure progress

After the work breakdown is identified, the tasks and activities are sequenced and their interrelationships are established to determine dependencies. At this point, time and other resource estimates should be figured for each task. After calculating resource requirements, the appropriate resources should be allocated at the task level to develop a schedule of project activity. Additionally, this activity detail is used to estimate resource costs.

The work plan is a component of the Project Development Plan, which is discussed in detail in Section 4.0 of this Guide. For the purpose of evaluating the organization and management of the project, the QAT requests agencies completing initial project risk analysis questionnaires to identify the methodology used to perform the resource and cost estimating.

Throughout the project's life-cycle, the QAT may request the agency to provide project schedule and resource cost reporting. As described in Section 8.0 of this Guide, if the project is selected to undergo a post-implementation evaluation review, the agency will be requested to provide a cost history accounting of planned versus actual costs for the development of the project using the cost schedule formats as prepared for the Biennial Operating Plan. Additionally, the QAT will request a comparison of the planned project schedule with the actual delivery dates and provide explanations for variances.

## **4.0 PROJECT DEVELOPMENT PLAN**

The Project Development Plan (PDP) prepared by the agency should communicate project requirements and provide an organizational and management tool to effectively administer a major IR project and facilitate a successful outcome. The PDP outlines the project objectives and includes detail elements describing the scope of work, resource requirements, performance requirements, and measurement systems that will be employed by the agency throughout the project life-cycle. Additionally, the PDP describes the project management controls, risk management plan, and project management plan.

### **4.1 Purpose of a Project Development Plan**

The Project Development Plan provides a standard road map for use by the project manager, the project team, the QAT, agency management, etc., to communicate critical project planning and management information in a timely and dynamic manner.

The PDP also serves as a checklist to ensure that different steps in the development process are incorporated to improve the probability of successful project completion. The plan is dynamic, and therefore should be updated at regular intervals, or as needed, to reflect changes that may occur during the project's life-cycle.

The plan is used by the QAT and the agency during the entire project review process to

- evaluate whether the project is on schedule and within budget
- determine the Team's level of participation in project events such as executive briefings and acceptance of project deliverables
- evaluate the frequency and completeness of the risk analyses and the corresponding risk management plans

### **4.2 Plan Development Process Description**

The agency project manager is responsible for developing, maintaining, and updating the Project Development Plan.

1. After the project team and the users agree on a desired solution, PDP development is initiated. Because the PDP provides a framework to identify project resource requirements, estimate costs, and prepare a schedule and work plan, it should be completed prior to, or concurrent with, the preparation of the Biennial Operating Plan.

2. The project manager should coordinate the development, review, and/or approval of the PDP with the following agency staff:
  - project team members
  - information resources management
  - end users
  - user management
  - agency executive management
  - agency project steering committee

The PDP, upon receiving final approval by the agency's Information Resources Manager (IRM), should be distributed to the project team members and the agency's oversight committee(s). The document is updated and managed by the project manager, and should be available for review by the QAT if requested.

3. If requested, the PDP is submitted to the QAT. Based on the information provided in the PDP, the QAT either assigns an initial risk level, or if previously assigned, retains or modifies that level, and assigns a commensurate level of project monitoring. The QAT notifies the agency of its decision.

The PDP is used by the QAT and the agency as a basis to compare planned project performance relative to its products, resources, schedule, and costs with actual project performance. When an agency amends its plan, the process described above is repeated. Section 4.5 provides some of the conditions under which a plan amendment should occur.

### **4.3 Elements of a Project Development Plan**

The Project Development Plan describes how the project will be accomplished. The PDP communicates project goals and objectives and how they will be measured. The plan addresses all phases of the project, including post-implementation activities required to achieve the planned project outcome measures. Appendix C provides a description of the following elements, which reflect project information that should be described in the PDP:

1. Introduction
  - a. project overview
  - b. project deliverables
  - c. evolution of the project development plan
  - d. reference materials
  - e. definitions and acronyms



2. Project Organization
  - a. process model
  - b. organizational structure
  - c. organizational interfaces
  - d. project responsibilities
3. Managerial Process
  - a. management objectives and priorities
  - b. assumptions, dependencies and constraints
  - c. risk management
  - d. monitoring and controlling mechanisms
  - e. staffing approach
4. Technical Process
  - a. methods, tools and techniques
  - b. work products and reviews
  - c. plans for user documentation
  - d. software quality assurance plan
    - (1) standards and conventions
    - (2) product and process reviews
    - (3) problem reporting and corrective action
    - (4) tools, techniques, and methods for software quality assurance
    - (5) supplier quality assurance
  - e. software configuration management plan
    - (1) configuration management supporting procedures
    - (2) baseline and build plan
    - (3) change control process
    - (4) configuration status accounting
    - (5) configuration audits
    - (6) tools, techniques, and methods for configuration management
    - (7) supplier configuration management
  - f. records collection, maintenance and retention
5. Work Packages, Schedule, and Budget
  - a. work packages and dependencies
  - b. resource requirements
  - c. budget and resource allocation
  - d. schedule
6. Additional Components

**NOTE:** Use of the IEEE Standard Software Development Plan or other similar template, such as that in Appendix C, is recommended. Verify that any template selected includes all of the elements requested.

#### **4.4 Planning Tools**

If the systems development methodology used by an agency does not include an equivalent planning tool, the agency should establish a standard template of major tasks and milestones typical for major information resources projects. The template should describe the work effort at the task level, describe the task's relationship and dependency to other tasks, and offer a basis for time estimating. Such a template can be developed in-house based on procedures used in previous major development projects. This template can then be copied and modified to fit new projects. The project manager can establish timeframe estimates and staffing requirements for those tasks and milestones using past experience from similar tasks (top-down approach).

A template includes a universal set of tasks, milestones, products, and deliverables that are typical work requirements of a systems development project. An actual project plan represents a customized subset of the standard template. Project-specific plans include the process of validating the project manager's top-down estimate with task-level estimates provided by the project team (bottom-up approach).

When developing a project plan for a specific project, follow these steps:

1. Select the most appropriate tasks, milestones, and deliverables from the agency's standard template/methodology.
2. Identify and add any needed tasks, milestones, and deliverables that were not included in the template.
3. Modify or create the description and time estimate for each of the tasks, milestones, and deliverables.
4. Specify any date constraints.
5. Estimate total elapsed time, based on the available IR resources, and schedule the entire project.
6. Prepare a cost estimate for each phase of the project plan.

#### **4.5 Project Development Plan Amendment**

The Project Development Plan is an evolving document that keeps pace with the project's enhancements and changes. When a project plan changes during the development life-cycle, submit a plan amendment to the QAT.

Some of the events that initiate a PDP amendment include

- scheduled plan review points are reached (for example, user or management review points)
- additional specific information is known for tasks that were previously projected
- functional requirements/outcome measures change significantly,
- technical design specifications change
- project costs change by 10% within any fiscal year
- any major milestone with precedent relationship to future activity on the project's critical path is delayed
- the project's start or end date changes by three months or more



## 5.0 RISK ANALYSIS

Risk analysis is the evaluation of an organization's ability to execute planned project activities, events and deliverables given the presence of opposing factors. The analysis process identifies and prioritizes each of the factors of risk, assesses the probability of failure due to the risk, and analyzes the consequences of such a failure. Risk analysis yields a profile of the project risk factors, reflecting ratings from higher to lower levels of risk. These factors and their risk levels vary by agency, by project, and by phase within the project development life-cycle.

### 5.1 Purpose of a Risk Analysis

Risk analysis is a proactive planning function that is performed for the purpose of identifying and rating elements of risk, or risk factors, that have the potential to compromise the successful outcome of the project. After each of the risk factors is rated according to its probability and consequence of failure, the next step is to develop an action plan to manage risk. The risk management plan, described in Section 6.0 of this Guide, communicates the appropriate action needed to increase the probability of producing a desired outcome while minimizing the risk of failure. Risk analysis provides the project manager and agency management a decision support tool that enables appropriate planning to occur.

### 5.2 Risk Analysis Process Description

Risk analysis is performed periodically by the agency during the project life-cycle, beginning in the initial project planning phase, ideally during the feasibility study. Results of an initial risk analysis can then be considered during the process of selecting an appropriate technology solution. The agency's initial, internal risk analysis is then included in the initial project risk analysis questionnaire, if requested by the QAT. The agency performs additional, internal risk analyses throughout the project's life-cycle. Future risk analyses can direct management actions to mitigate the risks to the project.

The QAT may request a separate risk analysis, performed by an independent risk assessor. The independent risk assessor, accepted by both the agency and the QAT, performs the analysis in addition to the agency's internal risk assessor.

**NOTE:** *Both internal and independent risk analyses may employ the standard methodology in use by the agency or may utilize a separate methodology, provided the chosen methodology conforms to the minimum requirements set forth in Section 5.3 of this Guide.*

The process described below includes both risk analysis functions.

1. In the course of conducting its feasibility study, the agency performs a risk analysis that is then considered as a factor in selecting an appropriate technology solution.
2. If the agency is requested to complete an initial project risk analysis questionnaire, the agency includes the internal risk analysis in its response.
3. The QAT may determine that an independent risk analysis is needed after reviewing the agency's completed initial project risk analysis questionnaire or after reviewing the Project Development Plan.
4. If an independent risk analysis is required by the QAT, the agency selects an acceptable independent risk assessor and schedules the risk analysis.
5. Upon completing the risk analysis, the independent risk assessor provides the QAT and the agency with the detailed results of the risk analysis, including documentation describing the methodology used.
6. In response to the risk analysis findings, the agency prepares a risk management plan and submits the plan to the QAT.
7. Depending on the risk levels identified and their corresponding impact, or in the event the QAT determines that external or internal factors have caused a significant change in the project, subsequent independent risk analyses may be required throughout the project's life-cycle.
8. The agency conducts additional risk analyses during the project development. These analyses and corresponding risk management plans may be submitted to the QAT, if requested.

**NOTE:** *The requirement to perform independent risk analysis does not supplant the agency's internal risk analysis function. Internal risk analysis should be performed by the agency throughout the project life-cycle, both as a scheduled activity and as circumstances warrant.*

**NOTE:** *Based on factors and concerns within an agency, the agency can have an independent risk analysis performed at intervals during the project development.*

### 5.3 Elements of a Risk Analysis

Risk analysis is the process of identifying and evaluating risk factors, present or anticipated, and determining both the probability and the impact should a failure occur. Some of the factors that are considered in a risk analysis are identified below. Additionally, Appendix B of this Guide provides a risk factor matrix that delineates these same factors and provides examples on how to rate them. The independent or internal risk assessor should use either this risk factor matrix or the methodology tool in use by the agency to compute a risk rating for each factor.

Each factor is rated according to its probability of failure as high, medium, or low. Also, the factor is analyzed to determine the impact of failure, again rated according to severity as high, medium, or low. This analysis provides a basis to prioritize the risk factors.

**NOTE:** *All factors rated as high risk should be addressed in the risk management plan.*

1. **Agency Factors**—These factors relate to circumstances that impact the project or the agency's work methods, but are beyond the influence or control of the project team. These factors include, but are not limited to:
  - Agency mission and goals
  - Statewide IR strategies
  - Work methods of agency
  - Agency clients
  - IR project history/experience
  - Organizational stability
  - Performance objectives
  - Monitoring process
  - Project size and scope
  - Policies and standards
  - Management requirements
  - Management experience with similar projects
  - Commitment to project
  - Agency executive management involvement
  - Quality assurance
  - Customer service quality

2. **Budgetary and Cost Factors**—These factors relate to the amount or availability of funding and the accurate identification and tracking of all cost components of the project. These factors include, but are not limited to:

Funding sources and constraints

Economic justification/cost-effectiveness

Budget size

Cost and schedule review

Cost controls that address the following:

- |                            |                     |
|----------------------------|---------------------|
| • Evaluation               | • Testing           |
| • Development              | • Installation      |
| • Initial data preparation | • Conversion        |
| • Operations               | • Maintenance       |
| • Staff                    | • Hardware/Software |
| • Training                 | • Security          |
| • Backup                   | • Disaster Recovery |
| • Facilities               | • Contracts         |

3. **User Factors**—These factors relate to the needs and requirements of the end users, focusing on the goals of the project and the intended results. Factors include, but are not limited to:

User involvement on project team

User justification

User acceptance

Achievable and measurable benefits

User requirements definition

User experience in IR projects

Deliverable requirements

User training requirements

4. **Project Management Factors**—These factors concern issues relating the guidance, control, and oversight of the project that could impact its success. Factors include, but are not limited to:

Manager experience

Manager authority

Manager commitment

Management approach

Development methodology, including:

- |   |                      |
|---|----------------------|
| • Project Development Plan                      | • Steps definition   |
| • Milestone review                              | • Status reporting   |
| • Change control management                     | • Elapsed time       |
| • Problem identification/<br>evaluation process | • Staff productivity |



5. **Project Team Factors**—These factors address the skills, background, and dedication of the project team. These factors include, but are not limited to:
- Available resources
  - Commitment
  - Technical training
  - Consultant/agency staff mix
  - Availability of productivity tools
  - Experience and expertise with:
    - Methodology
    - Software
    - Hardware
    - Productivity tools
6. **Technology Factors**—These factors relate to the solutions chosen within the context of available technologies and the ability of the solutions to work in the existing environment. The factors include, but are not limited to:
- Complexity of requirements
  - Analysis of alternatives
  - System integration/interfaces
  - Complexity of technology
  - Complexity of hardware and software interfaces
  - Open systems
  - Vendor support
  - Multiple vendors/major contractors
  - Physical security
  - Data security
  - Backup
  - Disaster recovery
  - Maturity of solution:
    - Leading edge (less than 1 year)
    - State of the art (1–3 years)
    - Mature technology (3–5 years)
    - Aged technology (5+ years)
7. **Other Factors**—The risk assessor may find other areas within a project or an agency that may pose a risk.

After completing the identification, prioritization, and rating of each risk factor, the project team can then develop the risk management plan.



## **6.0 RISK MANAGEMENT**

Risk management involves monitoring already known risk factors and actively seeking the emergence of new elements of risk, so that action can be taken before problems occur. Risk management is the agency and project team response to the risk analysis results. Based upon the output that identifies, analyzes, and prioritizes risk factors according to both the probability and the consequence of failure, the agency develops an action plan, or risk management plan, to increase the probability of producing a desired outcome while minimizing the risk of failure.

### **6.1 Purpose of a Risk Management Plan**

The purpose of the risk management plan is to communicate both preventive action, or risk avoidance, and corrective action, or risk mitigation, to each of the identified risk factors, particularly those with a medium to high rating level. The plan addresses each identified risk and indicates the actions that are planned to eliminate or mitigate that risk. These actions include watching, controlling, and changing the development process, resources, and functional goals to reduce the probability of risk, lessen the impact, and provide for recovery if failure occurs. These actions compel a project team to examine alternatives on multiple levels to select the best path, thereby improving the team's ability to effect a positive outcome and meet project objectives.

### **6.2 Plan Development Process Description**

Risk management starts at the top of the organization and at the top of the project management team. Standard project management activities should address many of the project risk factors through risk avoidance. Responsibility for risk management is also shared by the user for whom the system is being developed. The user can control risk by insisting on good functional specifications that establish only the functions that are needed. Risk management is also the responsibility of each person on the project development team, who should be trained to detect and report risk issues. Risk is inherent in new undertakings, but it can be mitigated through a team approach to identification and management.

The agency project manager is responsible for developing, maintaining, and updating the risk management plan. The following steps represent the process:

1. Upon completion of the internal or independent risk analysis, the agency prepares a risk management plan.

2. The completed risk management plan is submitted to the QAT for review, if required.
3. Based on the information provided in the risk analysis and the risk management plan, the QAT retains or modifies its initial assignments of risk and project monitoring levels. The QAT notifies the agency of its decision.

***NOTE:** After a risk analysis is conducted independent or internal the risk management plan should be modified to reflect action(s) required to eliminate or mitigate the risk(s).*

### 6.3 Elements of a Risk Management Plan

High risk factors are assigned high priority and should be incorporated in the risk management plan. Lesser risks should be addressed as resources are available. The risk management plan is separate from the Project Development Plan, but it should reference specific milestones or processes in the PDP that could be affected by the risk factors.

The following elements should be included in a risk management plan. Examples are provided where appropriate to illustrate the intent of the plan element and are not intended to reflect the level of detail necessary to address risk management.

1. **Overview of the risk items**—A discussion of the overall set of risk items and their relationship to the project plan.
2. **Risk matrix**—The risk factor matrix or list that classifies each risk element by a unique identifier.
3. **Risk description**—A description of each risk element, showing its relationship to specific project events or activities. The description should reference which project milestone or process would be impacted by the risk element.

*Example:*

Risk #	Description	Nature/Cause	Impact
34	Danger of late software interface	Lack of optimum programming environment due to inexperienced programmers	Milestone #4: deliver interface to kiosk software

4. **Objective and alternatives to averting the risk**—Describe the goal or objective in averting the risk. Describe alternative approaches to averting the risk, showing impact to project cost, schedule, and quality.

*Example:*

Risk #	Aversion Objective	Alternatives	Impact to Project Cost, Schedule, Quality
34	Create a more favorable programming environment	A1. Provide training	Cost: \$7,200 Schedule: delay milestone #4 for 2 months Quality: improve number of lines of error-free code
		A2. Hire contract personnel	Cost: \$43,000 Schedule: delay milestone #4 for 2 weeks Quality: improve number of lines of error-free code

5. **Deliverables of the risk management plan**—Identify the tasks, milestones, and personnel assigned to the risk reduction effort.

*Example:*

Risk #	Task	Task Description	Milestones	Person(s) Assigned
34	34.1.1	Investigate getting GUI-trained programmers	second week	W. Smith
	34.1.2	Investigate hiring contractors	second week	S. Jones
	34.1.3	Investigate availability of GUI development tools	third week	G. Willows
	34.1.4	Have tools and training plan	sixth week	G. Willows
	34.1.5	Have new personnel on board, if approved	sixth week	W. Smith

6. **Resource requirements of selected approach**—Identify the tasks and resource requirements of the selected approach.

*Example:*

Risk #	Task	Task Description	Resource Requirements
34	34.2.1	Move GUI-experienced staff from completed database project	12 programmers for 2.5 years: \$480,000 per year for 2.5 years (salaries)
	34.2.2	Use GUI development tools where they are shown to be cost-effective and efficient	\$25,000 for 12 each – 486 workstations \$10,000 for workstation connection to network \$50,000 for productivity software

7. **Risk integration and relation to the Project Development Plan**—Provide a narrative that addresses the interrelationship of risk factors, and that references each individual or compound risk factor back to the overall Project Development Plan. Additionally, for this section:

- a. Investigate and develop a report explaining any interrelationship that the risk elements have between each other. Questions to consider are:
  - How does reducing one risk element increase another?
  - What can be done about it?
  - Is it better to have the risk in this area or another? It may be that the increased risk in the other factor is more acceptable as it may be easier to monitor and control.
- b. Add any further explanations to references to the Project Development Plan.
- c. Examine overall issues of environment and other factors that generally affect the project and should be watched, but are not now causing specific risk elements. Any relationships and sensitivities may be addressed here.

The project manager is responsible for tracking the plans, personnel, and the project itself, and ensuring that the process continues. The project manager is also responsible for updating the risk management plan when new risks are identified.

## **7.0 PROJECT MONITORING**

The QAT monitors a project to ensure it has the means to meet its objectives. Project monitoring determines when a deviation from the plan occurs and assesses the impact of that deviation on overall project delivery.

### **7.1 Purpose of Project Monitoring**

The monitoring process is intended to aid the agency and the Quality Assurance Team in identifying areas of high risk and possible failure points. After identification, appropriate corrective action should be taken to assure the success of the project. During the course of project monitoring and review, if a project is determined to be failing and unable to meet its objectives, the role of the QAT is to advise agency leadership and state leadership to discontinue the IR investment.

The purpose of project monitoring is to detect

- processes or outputs that deviate from the plan(s)
- risks that are identified in the risk analysis by project management
- processes that do not effectively address quality assurance in performance or product delivery
- areas where costs are not in accordance with the budget

Additionally, project monitoring will enable the QAT to identify:

- best practices that can be shared with all agencies, and
- successful projects that could be used as models for other agencies.

### **7.2 Project Monitoring Process Description**

Project monitoring begins after the QAT determines the project meets the criteria for Quality Assurance Review. The level of monitoring is assigned by the QAT and typically corresponds to the project risk level assessment.

Monitoring can begin in the initial planning stages or commence later in the project and generally continues through the implementation phase. Post-implementation monitoring consists of verifying that the agency evaluates the benefits and other performance measures realized against those predicted to determine if the project met its goals and objectives.

The QAT continually assesses project information to ensure that an appropriate level of monitoring, corresponding to the level of risk determined by the Team, is maintained. Review of project information can occur throughout all project phases. The QAT determines and adjusts its monitoring level based upon its review of the product submitted by the agency upon completion of each step.

A list of the steps, the products, and the corresponding QAT monitoring decision points is provided in the following table:

Step	Description	Agency Product	QAT Review Decision
1	If a project meets the criteria for Quality Assurance Review, the QAT may request the agency to complete and submit to the QAT an...	...initial project risk analysis questionnaire	Upon its review, the QAT assigns an initial risk level and a corresponding monitoring level, and/or requests additional input.
2	Based on the initial risk level assigned by the QAT, it may request the agency to submit to the QAT a...	...Project Development Plan	Upon its review, the QAT assigns an initial risk and monitoring level, or retains or adjusts those levels, and/or requests additional input.
3	Based on information provided in the PDP, the QAT may request the agency to conduct, produce, and submit to the QAT an...	...independent risk analysis and risk management plan	Upon its review of both documents, the QAT retains or adjusts its risk/monitoring levels.

**NOTE:** *Throughout the project life-cycle, if the QAT determines the project fails to meet its objectives, the QAT may initiate the process to rescind project funding. The agency may appeal that decision to the Quality Assurance Team.*

Project reviews provide the opportunity for the QAT to review all pertinent information, that is, results of the internal or independent risk analysis, monitoring status, and any other available information, to evaluate whether the project is meeting its objectives. Monitoring enables the agency and the QAT to assess progress and determine if, or when, the agency needs to conduct and prepare, or update, its risk analysis and management plan. This can occur when:

- new, significant risks are identified,
- risks potentially impact the objectives of the project, or
- risks contribute greatly to the system's operational and/or support costs.

Generally, project monitoring and review continue through each phase of the project development life-cycle. The agency and the QAT work together in this process to evaluate the quality of the project development.

**NOTE:** *Throughout the project life-cycle, the QAT may deem a project be waived from review. Likewise, the QAT may review previously waived projects when circumstances dictate.*



### 7.3 Types of Project Monitoring Activities

The following types of monitoring activities are typically employed by the Quality Assurance Team:

- attending user conferences
- attending project meetings
- attending executive briefings on project status
- interviewing the project manager, project team, users, and agency executive management
- validating the project management processes, change control process, project tracking and status reporting mechanisms
- comparing project status reports with the PDP to determine timeliness
- visiting the project site to assess project progress
- evaluating project expenditures, both staff time and other expenses, and comparing expenditures with projections
- consulting with outside entities involved in the project development such as federal counterparts, other state agencies, user staff, consultants, etc.
- meeting with Internal Audit staff to review the project plans
- analyzing the Project Development Plan
- evaluating agency quality controls for acceptance of project deliverables
- analyzing the post-implementation evaluation review to determine the success of the project

As stated previously, the monitoring level generally corresponds to the level of risk identified. For the highest risk projects, monitoring could include most of the above activities. For other projects, monitoring might include QAT review of quarterly status reports, attending regularly scheduled briefings by project staff, and conducting random visits to the project site to assess progress as compared to project development plans. The level of monitoring will correspond to the circumstances of the project and the level of risk determined by the QAT.

### 7.4 Elements of Project Monitoring

Throughout the project development life-cycle, the QAT will review relevant project information as part of its monitoring process. Information that is reviewed and analyzed is, in part, provided by documents such as the Biennial Operating Plan, the initial project risk analysis questionnaire, the Project Development Plan, results of the internal risk analysis, and the risk management plan.

1. Specific information the QAT considers in its initial review includes:
  - project narrative information from the Biennial Operating Plan,

- responses to the initial project risk analysis questionnaire,
  - costs and funding sources as projected on the Project Summary Schedule in the BOP or the Project Development Plan,
  - summary of major expenditures expected in the development phase,
  - other information available from the agency or the QAT.
2. If the QAT determines that the project has the means to meet its objectives and recommends continuance of funding, the following may be assigned by the QAT:
    - the level of monitoring (commensurate with the level of risk identified),
    - the time frame during which the agency will conduct an independent risk analysis and submit a risk management plan, if required,
    - when to submit a Project Development Plan, if required, and
    - special monitoring issues for the QAT to review.
  3. The QAT will monitor and periodically review the project. The following conditions will necessitate a review by the QAT:
    - the QAT detected major problems or deviations from the Project Development Plan or risk management plan,
    - the special monitoring issues have been resolved or have escalated to a level requiring notification of the QAT,
    - the project has been completed,
    - an amendment to the Biennial Operating Plan for this project has been approved,
    - the independent risk analysis and risk management plan have been completed, or
    - other conditions are detected by the QAT that indicate the project be reconsidered.
  4. The monitoring and review process continues until after project implementation, at which time the QAT determines the need to analyze and evaluate the outcomes of the project through a post-implementation evaluation review. If the QAT requests the agency to conduct and report to the QAT the results of that review, it will consider the following in assessing the success of the project (see Section 8.0):
    - project report that describes the project history, management, and development methodology, and compares the project planned-to-actual approach relative to scope, resources, schedule, and cost,
    - comparison of planned-to-actual performance measures and benefits,
    - description of the lessons learned, best practices, and recommendations for improvement, and
    - feedback from the user.

## **8.0 POST-IMPLEMENTATION EVALUATION REVIEW**

A post-implementation evaluation review assesses project outcomes to verify whether the project achieved the desired results and met the strategic outcome measures predicted by the agency, within the planned cost and schedule.

In order to determine the success of a project, the agency needs to evaluate the performance of the system after it is implemented. Through the post-implementation evaluation review (PIER), the agency and the QAT determine whether the project met its objectives and evaluate the development and management processes that supported the project. The review also compares actual, total project expenditures to the project cost estimates.

### **8.1 Purpose of a Post-Implementation Evaluation Review**

A post-implementation evaluation review is conducted after system implementation to enable an agency to evaluate the role of, and measure the value gained through, information resources in support of the agency's strategic objectives. The PIER provides documentation of the success of a system and the reasons for that success.

The post-implementation evaluation review is a tool for determining whether the technology investment is yielding the expected benefits to the processes, products, or services supported by the agency. Additionally, the PIER provides a standard approach in which to evaluate a project's outcome and, therefore, fosters an understanding among IR management, user management, and executive management of the relationship between the IR investment and the agency's strategic goals. This type of systematic, formal evaluation creates a "common language" that can be used to communicate IR performance to all interested and involved parties.

Agency management can use the outcome measures to monitor trends in IR activities and to track the effect that various interventions, policies, and/or practices have on operations. The post-implementation evaluation review allows agency management to facilitate better planning and development within their management span.

During the development process, the project team should have monitored all project-related expenditures through a cost tracking system. By analyzing actual expenditures as compared to budgeted expenditures, the project team can refine its cost estimating techniques and improve future project estimates.

Most importantly, by doing a final review of a system, executive management can obtain feedback on their information resources decisions.

## **8.2 Post-Implementation Evaluation Review Process Description**

Preparation for the post-implementation evaluation review process actually begins during the initial stages of the project development. As described in Section 3.0 of this Guide, the project team and the system's primary benefactors define the performance measures and expected benefits during the planning phase of the project. These performance measures and expected benefits are then approved by the system's stakeholders and agency management.

Finally, the project team ensures that appropriate systems and methods to collect and track the measures are implemented so that project performance reporting can be maintained throughout the project's life-cycle and/or after system implementation. These measures are then made available to the Quality Assurance Team if the agency is requested to perform a post-implementation evaluation review.

The project team should measure outcomes at least twice; once, after establishing a baseline outcome measure prior to implementing any project-related service and again after full services are made available. The difference in the two measurements will reflect the improvements realized from the IR investment.

Upon completion of a major information resources project, if the QAT requests the agency to prepare a post-implementation evaluation review, the agency project manager is responsible for coordinating the review three to six months after system implementation. To support this effort the following process should be implemented in the agency:

1. The project manager should ensure that the project's outcomes (performance measures) established by the primary benefactors of the system prior to project initiation can be reliably obtained through a valid tracking and reporting system.
2. Performance measures should be gathered prior to implementation and again three to six months after implementation. This post-implementation period will allow consideration of the initial learning curve of the users of the system and provide a more valid comparison to the earlier measurement(s). These project measures report the actual benefits received from the IR project investment. Final project measurements are reported to the QAT.

3. The agency should ensure the appropriate staff and management participate in the post-implementation evaluation review. A product of the review is a project report that provides the elements identified in Section 8.3. The following staff should be included in the review:
  - **Project team and management**—Their contribution should focus on the lessons learned in the project management process. These lessons may lead to changes and improvements in the management of future projects.
  - **User staff**—Their focus is on the performance measures and benefits as well as the lessons learned from the project management process. The user staff should compare the performance measures to the initial measurements and determine if the project realized the planned performance and benefits.
  - **Agency executive management**—Their focus is on the benefits derived by the system. Because they approved the project, they need to know if the project actually achieved the benefits that were used to make that initial decision.
  - **Customers directly impacted by the system**—Their focus is on service. If applicable, this group should participate to measure the benefits that apply to them and any lessons learned during the implementation process.

### 8.3 Elements of a Post-Implementation Evaluation Review

The following elements should be included in a post-implementation evaluation review:

1. **Project history description**—Provide an executive overview of the technical solution selected to satisfy the project objectives. Briefly describe changes from the original design that occurred during the course of the project development. Incorporate a brief overview of the chronology of the project that highlights turning points in the development and implementation of the system.
2. **Cost history**—Provide an accounting for the actual costs for the development of the project using the cost schedule formats as prepared for the Biennial Operating Plan. Show a planned cost history that reflects the approved BOP amendments and the updated BOP schedules. This should show all changes from the first BOP estimates through all updates to the final cost schedules submitted.

Include a comparison of the costs, actual and planned, and explain the major differences. When explaining the variances, describe how the costs changed, describe the impact of those changes, and briefly

describe what led to each change.

3. **Project Management and Systems Development Methodology Descriptions**—Describe the primary project management methodology and systems development methodology used to develop the system. Include a description of the parts of the systems development methodology that were used and those that were not used, and explain the impact of these decisions. Include a description of which parts of the project management methodology were used and not used, and explain the impact of these decisions.

Include comparisons of the initially planned dates for milestones and deliverables to the actual delivery dates, and briefly explain the major differences in schedules. When explaining the variances, describe how the schedule changed, the impact of those changes, and what led to each change.

4. **Performance Measures**—Provide a list of the performance measures initially used to justify the project. Provide a comparison of the initial performance measures to the actual, realized performance measures for the system. Include a description of how the project changed the organization and/or the delivery of services.
5. **Lessons Learned**—Describe the lessons learned during this project. These lessons will show the planning and development process improvements that can be used for future projects. These could include, but not be limited to, lessons learned about:
  - the project management process
  - the systems development process
  - the contracting methodology used
  - the training received and/or provided
  - the conversion tasks
  - other parts of the project development process that appear to need changing for future projects
  - the technology that was used
  - the software used
  - improvements in the project team
  - changes in state rules and regulations to remove barriers from future endeavors

Include recommendations for improvements to better aid projects for any state agency in the future. Describe the best practices identified in this project that should be repeated in the next project.

6. **Impact of the System**—Briefly describe the general impact of the system on the managers, users, and customers. Provide executive management's feedback on the success of the system, the benefits realized, and the improvement in performance measures. Include user feedback on the success of the system, the benefits realized, and the improvement in performance measures.

